

The grab bucket can be opened in three ways—(1) By pulling the lowering chain while holding the lifting chains, which raises as well as opens the bucket; (2) By holding the lowering chain and letting out the lifting chains, which lowers as well as opens the bucket; (3) By a combination of the first two methods, which simply open the bucket without altering its height. These methods of opening the bucket have been found to be of great advantage, for the driver need not be very particular as to the height of the grab bucket when about to open it, as he has complete control of all its actions.

The cheeks of the crane are formed of wrought iron, and with a roof serve as a protection from the weather.

The Melbourne Harbour Trust Commissioners having had a crane on this principle constructed, mounted on a Smeaton's ring and built on a special pontoon for dredging purposes, I have been enabled to prove by actual experiment that the dynamical principles of the machine, as described, are correct. The crane is now at work on the Yarra, where it is found to be capable of making a complete set of dredging operations in forty-five seconds, so that the bucket, containing from two and a-half to three tons of silt, can be lifted easily within one minute, controlled by one man.

The crane is capable of being constructed in a portable form. The modification referred to in the patent specification is designed for digging dams and other pastoral station work, and for portability.

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ART. XIV.—*A Note on the Apparatus to be used in Viewing the forthcoming Transit of Venus, in December, 1882.*

BY R. L. J. ELLERY.

[Read 14th September, 1882.]